Space Weather Forecast

Issued on Tuesday, 20 September 2022 at 13:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Ongoing chance of Moderate flares/R1-R2 Radio Blackout. Minor or Moderate geomagnetic storm intervals likely from late day 3 into day 4 (22nd/23rd).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate over the past 24 hours with one Moderate class flare observed. The most notable sunspot region is a moderately sized region in the southwest quadrant of the visible disc. However, this remains magnetically simple and relatively stable. Another small and simple region is decaying as it approaches the southwest limb. A returning region is also gradually becoming more visible at the southeast limb, there is already evidence of magnetic complexity and this region will be monitored for development as it rotates further across the visible disk.
No Earth-directed CMEs (coronal mass ejections) were observed in the last 24 hours.
Solar Wind / Geomagnetic Activity: The solar wind was slowly easing to slightly elevated levels. The total magnetic field strength has been weak, with only short periods where the north-south component was southward pointed. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was close to background levels, with no solar radiation storms.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low, with a chance of isolated Moderate flaring, primarily from the main sunspot on the disc, or from the returning region currently rotating onto the visible disc.
Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently expected. Slightly elevated solar winds are expected to ease towards background by day 2 (21st), with the next enhancement, from the fast wind of CH25/+ expected either late day 3 (22nd) or day 4 (23rd). Geomagnetic activity is expected to be mostly Quiet with isolated Unsettled spells. There is then the likelihood for activity to increase to Active to G1 or G2/Minor or Moderate Geomagnetic Storms from late on day 3 (22nd) into day 4 (23rd).
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to continue close to background levels. The most likely source of any enhancement would be from any activity from the main sunspot group which is now located in the southwest quadrant.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	40	60
Strong	G3	No	1	1	5	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	30	30
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	3	3	3	3
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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